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Changing patterns in vocational entry qualifications, student support and outcomes in undergraduate degree programmes

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Contents

Section	Page
Executive summary	5
Methodology	5
Findings	5
Recommendations	6
1. Context and goals of the study	7
1.1 Goals and objectives	7
2. Related literature	9
3. Methods and methodology	11
3.1 Overall design and approach	11
3.2 Quantitative design	11
3.3 Qualitative design	13
3.3.1 Student focus groups	13
3.3.2 The staff interviews	16
3.3.3. Analysis and reporting	17
4. Quantitative findings	18
4.1 Descriptive analyses	18
4.2 Statistical modelling	20
4.2.1 Model 1	20
4.2.2 Model 2	21
4.2.3 Model 3	21
4.2.3 Model 4	22
4.3 Validation and further analysis	23
4.4 Limitations and directions for future research	23
4.5 Summary of quantitative findings	23
5. Qualitative findings	24
5.1 Student focus groups	24
5.1.1 Post-16 qualification pathways	24

5.1.2 Learner Identities	25
5.1.3 Preparedness for higher education study by qualification (mix)	26
5.1.4 Student support post-16 and at university	28
5.2 Academic staff interviews	29
5.2.1 Tutor awareness of students' education pathways	29
5.2.2 How students fare	33
5.2.3 Impact on teaching approaches and support	35
5.3 Summary of qualitative findings	37
5.4 Limitations and directions for future research	37
6. Conclusion	38
6.1 Recommendations	38
7. References	40
Appendix 1: Qualifications coding scheme	42
Academic qualifications	42
Vocational qualifications	44
Appendix 2: Multi-level logistic regression specification	48
Model Specification	48
Interpreting regression coefficients	48
Appendix 3: HEA discipline clusters	50

Executive summary

The range of qualifications available to 16 to 18-year-old students has grown considerably, raising the question of how well different qualification types prepare students for studies in higher education. In particular, the number of students entering higher education with a BTEC qualification (named after the previous awarding body, the Business and Technology Education Council) has risen steadily, with estimates of annual increases in applicants ranging from 16% to 30%. While traditionally a vocational qualification aimed at direct entry to employment, marketing for the BTEC emphasizes its flexibility and suitability for progression to higher education.

In this context, the study analyses how well students with vocational qualifications are prepared for and supported in their studies at higher education.

Methodology

The study uses a mixed methods approach, combining a quantitative analysis of data from the Higher Education Statistics Agency (HESA) with qualitative data obtained from student focus groups and staff interviews at two universities, one of which is teaching-focused and the other of which is research intensive. The quantitative analysis provides an overview of how vocational qualifications are distributed among the student population, then uses statistical modelling to analyse whether students with vocational qualifications are as likely to achieve a first or upper-second class degree as their peers, controlling for demographic variables and entry tariff. The qualitative analysis examines how and why students chose secondary qualifications, and how well they feel they were prepared for university study. It also examines the extent to which academic staff at universities are aware of the students' previous study and whether they adapt pedagogical approaches accordingly.

Findings

The quantitative analysis first shows that vocational qualifications are unevenly distributed in the student population: students with vocational qualifications are more likely to be from areas with low participation in higher education and demographic groups associated with lower outcomes. Compared to the rest of the student population, they have a higher average age, higher proportion of male students, and lower entry tariff. However, the statistical modelling reveals that even when these factors are controlled for, students with vocational qualifications are less likely to receive a first or upper-second class degree.

The qualitative analysis paints a complex and nuanced picture of how vocational qualifications prepare students for higher education. In particular, it reveals the importance of avoiding a deficit model when thinking about vocational qualifications. Both students' self-perceptions and the views of staff show that students bring a wide range of different experiences and learning abilities to their higher education studies, and that all of these abilities can be useful in helping them to succeed. The quantitative analysis provides evidence that students with vocational qualifications are less likely to receive a first or second-class degree, all else being equal. Yet, the qualitative analysis indicates that students with vocational qualifications are highly capable, and possess qualities of confidence, interpersonal skills and a sense of agency that can help them succeed at the highest levels within the

higher education environment. This suggests that universities might better support their learning.

Recommendations

The findings of this study have a number of important implications for secondary and higher education relating to the marketing and regulation of qualifications, support for student success in higher education, and widening participation in higher education.

We would make the following recommendations to academic staff, higher education providers, sector bodies and government:

- 1 There is a need for better regulation and monitoring of secondary qualifications such as the BTEC. Particularly, claims that they prepare students for higher education should take account of evidence on outcomes. Organisations such as Ofqual and the Competition and Markets Authority should monitor the marketing of post-16 qualifications in respect to the claims they make about higher education.
- 2 Universities should do more to better support students with different types of qualifications. While tutors cannot be familiar with all types of secondary qualifications, teaching and learning enhancement teams within institutions can provide indications of the range of academic experiences that students will have across a range of different degree programmes. As the mix of qualifications varies by discipline, the Higher Education Academy could support this awareness through its discipline clusters.
- 3 Efforts in widening participation should seek to ensure that students with vocational qualifications are prepared for studies in higher education, and to provide appropriate advice about the success of students with vocational qualifications in their institutions. This could be co-ordinated through the National Networks of Collaborative Outreach programme.
- 4 Discussion on student retention and success should include vocational qualifications. While vocational qualifications are mentioned in the Department for Business, Innovation and Skills' (BIS) National Strategy for Access and Student Success in Higher Education (2014), they are discussed mainly in relation to access. Students with vocational qualifications should be added to the demographic groups for which BIS monitors retention and success. BIS and the Office for Fair Access (OFFA) should consider including students with vocational qualifications in their monitoring and reporting.

I. Context and goals of the study

This study is situated in the context of several interrelated changes in the education landscape. First, progression of 16 to 18-year olds into further study and employment has received growing attention. This shift has taken the form of an increased emphasis on apprenticeships (BIS 2015) as well a review on 16 to 18-year-old participation in education and training undertaken by the House of Commons' Committee on Public Accounts (2015). The review recommended the development of "effective ways to track young people's education and training activities" (Committee on Public Accounts 2015, p. 6).

Second, the number of students entering university with a BTEC qualification (named after the previous awarding body, the Business and Technology Education Council) has risen steadily, with estimates of annual increases in applicants ranging from 16% to 30% (Pearson 2011; Grove 2014). However, the marketing of these qualifications is ambiguous: Pearson – the company that offers the qualification – describes BTECs as "work-related qualifications for learners taking their first steps into employment", but on the other hand it cites figures of 95% progress into higher education or employment, and notes the qualification has been developed in consultation with higher education experts (Pearson 2015a). Eight of 12 "case studies" of BTEC graduates on the company's website mention progression into higher education, usually at relatively elite institutions such as Kings College, York, and Durham (Pearson 2015b). Thus, students investigating the BTEC "learning brand" receive mixed messages about its value and use.

Third, reforms associated with the Browne Review (Browne 2010) of higher education funding and finance, have created a dramatic rise in student fees and associated levels of debt, particularly in England, which has increased the financial risk associated with higher education studies. Students with lower degree outcomes that may result in reduced labour market value, will still accrue large amounts of debt that will last most of their working lives.

These three interrelated changes result in an increased need to understand how students with BTEC qualifications – and vocational qualifications more generally – fare in higher education. This topic has been subject of some debate and speculation. Mary Curnock Cook, Chief Executive of the University and Colleges Admissions Services, recently expressed the view that BTECs "typically produce students who are well versed in practical and laboratory work but who might struggle to cope with the extended reading and writing required for many courses, let alone for exams themselves" (Grove 2014). However, more concrete evidence on how outcomes differ by qualification type is remarkably scant.

I.1 Goals and objectives

The overall goal of this study is to analyse the implications of the context described above for university students with vocational qualifications in order to ensure they are adequately supported by institutions. This goal is accomplished through the following interrelated objectives:

- I A longitudinal multi-level analysis of data to examine differences in higher education outcomes and attainment for students by entry qualification, controlling for the subject of study, entry tariff, student's age, mode of study (full-time/part-time) and type of institution attended.

- 2 A qualitative study of the experiences, needs and expectations of undergraduate students; both those recently transferring from secondary and further education and those in the mid and final stages of their undergraduate programmes. A qualitative study of the extent to which relevant university academic staff are aware of differences in students' entry qualifications, and whether and in what ways they feel such differences might impact the students' learning and their own teaching practice.

Taken together, the analyses entailed in these objectives provide a comprehensive picture of how contemporary higher education supports students with vocational qualifications. In our conclusion, we identify the policy implications of these findings and make corresponding recommendations.

2. Related literature

The topic of vocational qualifications in higher education relates broadly to sociological literature on choice in education, as well as literature focused more particularly on access to and outcomes in higher education. Our literature search encompassed both bibliographic academic databases as well as publications of relevant organizations including BIS and Action on Access.

The links between secondary education and transitions to higher education and the labour market is a key theme in sociological research on education. In their 2000 study, Ball, Macrae and Maguire document how the increasing diversity of secondary qualifications was linked to the reproduction of class advantage in labour markets, as students with higher levels of cultural capital and dispositional characteristics (i.e. “habitus”) were better able to navigate the complex options available to them (Ball, Macrae and Maguire 2000).

A key tenet in New Labour educational policy was to increase the diversity and flexibility of educational qualifications in order to meet the demands of a changeable and fluid labour market (Hoelscher *et al.* 2008). This approach was consistent with broader European policymaking that emphasised the importance of lifelong learning, expanding access to higher education and possibilities for mid-career re-entry to education (Keeling 2006).

Informed by these contexts, a good deal of research has investigated access to education for students with vocational qualifications. For example, the work of Hoelscher *et al.* (2008) combines analysis of admissions data with case studies at several universities; their findings suggest that students with vocational qualifications are more likely to study at post-1992 institutions and are underrepresented in some subject areas (e.g. Medicine, Dentistry, Law, and Languages) and overrepresented in others (e.g. Computer Science and Agriculture). These findings are validated by more recent analysis from Universities and Colleges Admissions Service (UCAS), which states:

Data suggests that vocational qualifications, such as BTECs, do not facilitate progression to HE in the same way as A levels. For example, for every 100 A level students accepted into high tariff institutions in 2013, 3 BTEC applicants were accepted. By comparison, 49 BTEC students were accepted for every 100 A level students at lower tariff institutions. (UCAS 2014a, p. 6)

The report also notes that much of the increase in students who hold at least one BTEC is driven by students holding a mixture of qualifications, which means it is important that the analysis addresses this group.

The work of Connor *et al.* (2006) and Sinclair and Connor (2008) adds some context and explanation to these results, noting that decentralized admissions procedures often mean that central policies on admissions are not interpreted uniformly. Furthermore, information, advice and guidance provided by universities to students with vocational qualifications often lacks clarity, and students may not be aware of how they are treated in the admissions process. In their two-year follow-up study (Sinclair and Connor 2008), the authors note some improvement, especially in the quality of data available on vocational qualifications and also in the appropriate use of UCAS tariff points to provide some measure of equity.

Other research provides a counterpoint to these trends by highlighting the success of students in vocational pathways. Wilkins and Walker (2011) approach the topic through data collection in secondary schools, investigating how students pursuing applied subjects are prepared for university. They note that academic preparation within applied courses is strong, and suggest that “universities are misguided in assuming that applied courses do not develop in students the skills that they need to be successful in higher education” (Wilkins and Walker 2011, p. 461). However, their study primarily compares students with “applied” A-level subjects (e.g. graphic design, food studies, etc.) to those with more traditional academic subjects (e.g. Mathematics, Physics, English Literature, etc.), and generalizing results to all vocational secondary qualifications could be problematic.

Under the Conservative–Liberal Democrat coalition government, the emphasis in higher education policy making shifted from expanded access to marketization of the system, arguably to create a system that is fairer and financially sustainable. Reforms stemming from the Browne Review required students to pay the full cost of their education, nearly tripling fees at most institutions, but they also claimed to “put students at the heart of the system” by requiring institutions to report extensive data on outcomes, employment and staff (i.e. key information sets – KIS), therefore making higher education institutions accountable through the market (Browne 2010; BIS 2011).

The marketization of higher education introduces an element of moral hazard into transitions and decision-making: because of larger loans, students are responsible for their choices regarding higher education for many years after they complete their studies (Callendar, Cigno and Loporini 2009). While they are equipped with more information about institutions and courses, students also assume the risk associated with lower degree outcomes (i.e. lower overall marks which may hold less value in the labour market).

However, relatively little research has directly investigated the outcomes associated with vocational qualifications in higher education, although theoretical modelling suggests that expected outcomes from study are key to students’ decisions (Hillmert and Jacob 2002, pp. 319–34). This study makes a contribution to literature on vocational qualifications and higher education in several ways. First, existing literature has primarily emphasised access to higher education, looking at the parity of esteem of vocational qualifications and the representation of students with these qualifications in different institutions and subject areas. By focusing on degree outcomes, this study is able to focus on the support provided to students with vocational qualifications once they are in higher education. Second, the quantitative analysis is longitudinal, analysing data from five separate years. The longitudinal approach adds a new perspective to other analyses of large-scale data (i.e. Hoelscher *et al.* 2008) that analyse data from only one year. Additionally, because of the time period covered in the quantitative analysis (2008–13), it is able to investigate changes associated with developments in higher education policy, most notably the Browne Review. Finally, by employing a mixed methods approach, we are able to combine statistical analysis of macroscopic trends with insights into the experiences, expectations and needs of individual students, providing useful insights to improve higher education policy and practice.

Overall, our analysis of the literature shows that although several studies have investigated access to higher education for students with vocational qualifications, the issue of outcomes remains largely unstudied. However, the shifting policy landscape – in particular the marketization of the system and introduction of higher fees – means that outcomes are more important than in the past.

3. Methods and methodology

3.1 Overall design and approach

In order to achieve the goals and objectives discussed above and to investigate issues raised in the literature, we employ a mixed-methods approach to the research, examining how students' entry qualifications relate to their experiences and success in higher education. Using an explanatory sequential design (Creswell 2003), our research design consists of two distinct elements:

- A quantitative study and statistical analysis of degree outcomes for different students with different types of entry qualifications. This component of the study seeks to identify whether students with vocational qualifications such as a BTEC are likely to achieve the same degree outcomes as their peers with more traditional qualifications such as A-levels. Degree outcomes are related to characteristics of institutions through multi-level modelling.
- A qualitative study of how university students and their academic tutors feel their entry education prepared them for their current work. This component of the study seeks to understand students' own thoughts and views on their preparation for higher education and the challenges they currently face in their studies. It also seeks to uncover the ways differences in entry qualifications impacts undergraduate teaching practice and student support more generally. This information is collected through focus-group discussions with students and depth interviews with academic members of staff held at two universities, and analysed through thematic coding.

The goal of the mixed-methods design was to use the qualitative data gathered in the second component to explain and add depth to the macro-level patterns identified through the first.

3.2 Quantitative design

The quantitative component of the study focuses on how degree outcomes across higher education in the UK differ by students' entry qualifications. Specifically, we analyse whether existing data support the notion that students with vocational qualifications such as a BTEC are as likely to receive an upper degree outcome (i.e. an upper-second class or first class degree) as students with more academic qualifications such as A-levels.

This question is deceptively simple: while it is relatively straightforward to examine differences in degree outcomes by types of qualifications (this is done in Table 4 below), this analysis does not reveal much because vocational qualifications may not be evenly distributed among the student population. If there are large differences in the proportion of students pursuing vocational qualifications by gender, neighbourhood, or academic achievement, this may explain differences in degree outcomes rather than the qualifications themselves. Thus, a key goal for the analysis is to control for as many of these characteristics as possible. This type of analysis can be conceptualised as taking two hypothetical students with the same background (i.e. gender, social class, academic achievement), but different types of qualifications, and looking at whether data suggest that one would expect to see a difference in their degree outcomes at university.

Another key question is whether the success of students with vocational qualifications differs by institution as it is quite possible that in some institutions there is little difference in outcomes between students with different qualification types, while in others the difference might be quite large. A related question is what type of institutions support students with vocational qualifications well: higher education in the UK is characterised by a marked distinction between those institutions that historically focused on vocational education and attained university status following the Further and Higher Education Act 1992, and those universities that existed prior to 1992 and have traditionally focused more on academic research (Hoelscher *et al.* 2008). This division has implications for the labour market, and so it is important to test how it relates to degree outcomes for different qualification types. Thus a second goal of the analysis is to establish the extent of variation between institutions and to associate this variation with institutional characteristics such as research intensity and employment of graduates.

The data used in the analysis come from the Higher Education Statistics Authority's (HESA's) student population database. Specifically, our analysis investigates the following variables:

- **Degree outcome:** a binary variable indicating whether a student received an upper-second or first class degree. We hereafter use the term “upper degree” to describe a positive outcome on this variable.
- **Entry qualifications:** we code the qualifications in HESA's data into three categories: ‘academic’, ‘vocational’ and ‘other’. This approach is consistent with other studies (e.g. Hoelscher *et al.* 2008) and is further elaborated in Appendix I. Because students can have multiple qualifications, graduates are coded as entering with either (1) academic qualifications only, (2) vocational qualifications only, (3) a mix of vocational, academic and other qualifications, and (4) other qualifications only.
- **University entry tariff:** the entry tariff from the student's university application. This is calculated according to criteria set by UCAS, which aim to provide comparability across different qualification types. It is important to note that UCAS tariff points are not interpreted uniformly across all institutions and that the distribution of grades differs across qualifications; however, the data provide some measure of academic performance prior to entry to higher education.
- **Gender:** the students' self-reported gender, coded as ‘male’, ‘female’, or ‘other’.
- **Low participation neighbourhood (LPN):** a binary variable indicating whether the student comes from an area with low-rates of participation in higher education. This is used as a proxy for social class and is derived from HESA's POLAR3 data.
- **Age on entry:** the student's age when commencing study in higher education.
- **Part-time study:** a binary variable indicating whether the student studied part-time. Because this part-time study is not recorded as such, this is inferred for students who took five or more years to graduate. Thus, a student who studied full-time and repeated a year (e.g. due to failure of exams) would still be counted as full-time.
- **Year:** the year of graduation, covering five years from 2009 to 2013 (inclusive). This variable controls for changes in degree outcomes across the sector as a whole by year.

At the institutional level, we also analyse the following three variables:

- **Research intensity:** measured as the percentage of institutional funding received from research assessment (often called quality-related or QR funding). The most research-

intensive universities receive 50% of their funding from QR, while many institutions receive less than 1% of their budget from this source.

- **Graduate employment:** the percentage of graduates employed or in further study six months after graduation.
- **Pre/post-1992:** a binary variable indicating whether the institution attained university status before or after 1992.

Our analysis begins with descriptive statistics summarizing key characteristics of the data. We then proceed to present outputs from statistical models of the data. These models use a multi-level or mixed-effects approach, which presents an accurate balance of group-level effects (i.e. institutional differences) and individual characteristics (i.e. student qualifications and background). Our models use random intercepts and slopes (Pinheiro and Bates 2000; Goldstein 2003), with a full mathematical specification of the model provided in Appendix 2.

3.3 Qualitative design

The qualitative component of the study focuses on the experience of undergraduate students and their academic tutors in order to determine both how university students feel their secondary and post-16 education (school sixth form, sixth-form college, general further education college) in particular, prepared them for study in higher education and whether and in what ways differences in entry qualifications impacts on undergraduate teaching practice and student support more generally. Participants were recruited from two universities in the south-west of England that share a geographic location but differ in their focus (research versus teaching intensive), thereby ensuring that the study represents both pre-1992 and post-1992 institutions. Six focus groups, one for each first, second and final year cohort of each university, plus four undergraduate tutors from each university took part, comprising a total of 38 students and eight members of academic staff. The data have been analysed using thematic coding (e.g. Ritchie and Lewis 2003; Gibbs 2007) in order to explain and add depth to the macro-level patterns identified in the quantitative study, while allowing us to develop a broader understanding of the student experience and staff practice in the context of a greater breadth of pathways to HE study.

3.3.1 Student focus groups

This element of the research draws on students' own thoughts and views on their preparation for higher education and the challenges they face as they progress through their degree programmes. It helps us to understand the expectations and needs of students; both those recently transferring from secondary and further education as well as those in the mid and final stages of their studies. The focus groups provided a means by which to yield collective rather than purely individual understandings (Morgan 1997). The nature of group interaction within this approach allowed for a broad range of students with differing entry qualifications, studying across a number of different undergraduate programmes to interrogate their own as well as others' understandings.

A call was put out across undergraduate programmes within each university to take part in the study via student mailing lists. The call linked to an online sign-up sheet, where students were asked for their name, email address, programme and year of study, the qualifications they possessed prior to entering university (A-level, BTEC, etc.), and the date and time that each focus group would take place. Three groups of students were recruited from first, second and final year student cohorts from each university in order to capture potential

issues around progression over the course of a three (and in some instances four) year programme of study, where final year students had undertaken a placement year. Crucially, students were not restricted from taking part by the particular qualifications or mix of qualifications with which they entered higher education. This avoided setting up a *traditional* versus *vocational* dichotomy characterised by the two most common forms of entry, A-level and Level 3 BTEC, thus allowing for a deeper consideration of the increasingly diverse pathways that students are entering higher education from. A £20 Amazon gift voucher was offered to students as an incentive to take part in study, thus ensuring a high response rate and as broad and as representative a sampling frame from which to draw the respective focus groups as possible. A total of 336 responses were received from the pre-1992 university and a further 222 responses from the post-1992 university (see Table 1).

Table 1: Sampling frame by university, year of study and entry qualification

	A-level	Access to HE	BTEC	NVQ; HND; CACHE	IB	National Bac	Mix of Ac/ Voc	Pre-U; IFY	n/k other	Total N
Pre-1992										
1st Year	111	8	5	1	19	27	7	4	0	182
2nd Year	50	0	4	0	9	3	3	4	1	74
Final Yr.	41	1	2	1	1	16	2	1	12	77
n/k									3	3
Totals	202	9	11	2	29	46	12	9	16	336
Post-1992										
1st Year	51	13	4	3	4	6	26	0	6	113
2nd Year	22	10	2	2	2	4	18	0	3	63
Final Yr.	12	0	5	1	1	3	14	0	5	41
n/k									5	5
Totals	85	23	11	6	7	13	58	0	19	222

The size of the sampling frame relative to the overall population of students allowed us to give due consideration to the respective make-up of the groups in order to make them as representative of the university populations as possible. Students were selected to take part in the focus groups on the basis of entry qualification(s), subject discipline(s), gender and ethnicity; the latter being established, not entirely satisfactorily, on student names. We were unable to control specifically for age but took into account that those coming through an Access to HE Diploma would proffer some insights into the challenges of study as mature students.

There is some debate in the research methods literature over the relative merits of recruiting 'acquaintance' versus 'stranger' groups in the context of focus groups (Hennink 2007). Ultimately, the groups were in the main made up of both, since it was felt desirable to recruit two group members studying on the same programme where marked difference

in entry qualification existed (e.g. BTEC versus A-level) where possible, thus allowing us to tease out and foreground any inter-programme differences. The focus groups took place at the respective university campuses, where rooms of an appropriate size and layout (conference, boardroom, and u-shape) were booked, thus enabling a greater degree of eye-contact and effective whole-group discussion.

The make-up of the focus groups are shown in Table 2 (below), where student characteristics have been broken down by university (pre/post-1992), entry qualification type (academic, vocational, combined, and international foundation year), and discipline cluster (based on predetermined discipline bandings set out by the HEA – see Appendix 3 for details of the range of subject disciplines by cluster).

Table 2.1: Focus group make up by university, discipline cluster, and entry qualification type – Post-1992 university

Discipline cluster	Total n by cluster	Academic	Vocational	Combination (Acad/Voc)	Int. found. year
Arts and Humanities	5	3	1	1	-
Health and Social Care	-	-	-	-	-
Science, Technology, Engineering and Mathematics (STEM)	3	1		2	-
Social Sciences	12	1	9	2	-
Cross-cluster study	-	-	-	-	-
Unknown	-	-	-	-	-
Total n	20	5	10	5	-

Table 2.2: Focus group make up by university, discipline cluster, and entry qualification type – Pre-1992 university

Discipline cluster	Total n by cluster	Academic	Vocational	Combination (Acad/Voc)	Int. found year
Arts and Humanities	-	-	-	-	-
Health and Social Care	1	-	1	-	-
Science, Technology, Engineering and Mathematics (STEM)	9	5	2	1	1
Social Sciences	8	4	4	1	1
Cross-cluster study	1 (SS/AH)	1	-	-	-
Unknown	1	1	-	-	-
Total n	20	9	7	2	2

There is some debate over the optimum size of focus groups. Morgan (1997), for example, suggests between four and 12 people per group and to allow for over recruitment by as much as 20% in order to take account of people not showing up on the day. Invitations were sent out to eight students to take part in each focus group in the first instance and, following confirmation of attendance, emails were sent to the remainder of the sampling frame to alert them to the fact that they had not been selected but to thank them for their interest in the study. In the event, groups ranged in size from four to ten, given last minute cancellations and in one group, a misunderstanding on one student's part led to inviting two fellow students who had not initially signed up for the study. The group discussions lasted one hour and relied upon an interview schedule consisting of eight predetermined topic areas in order to open up a facilitated dialogue among the group. This allowed participants to expand on issues according to the discussion as well as allowing for further probing by the facilitator.

3.3.2 The staff interviews

Interviews with relevant university academic staff were undertaken to explore how aware they were of any differences in students' entry qualifications, whether and in what ways they felt differences might impact the students learning and their own teaching practice. Staff members were invited to take part where they had direct experience of teaching undergraduate cohorts, where possible represented different teaching faculties within their respective universities, and had experience of pastoral or administrative roles (e.g. admissions tutor), and thereby be potentially more familiar with differences in students' entry pathways. Semi-structured interviews of approximately 30 minutes duration were carried out with four members of staff from each university. This allowed the researcher to ask several key questions through an interview schedule that helped to define the areas to be explored, while allowing each participant scope to pursue a particular idea or response in more detail, thereby striking a balance between guiding the interview and allowing for

flexibility in response. The staff interviews were staggered, taking place prior to, during and following the focus group data collection, in order that ideas emerging from the student narratives might be drawn upon in an iterative manner within the staff interviews and vice versa.

3.3.3. Analysis and reporting

The staff interviews and focus group discussions were transcribed by a professional audio transcription service, using what is termed among many such companies as 'intelligent verbatim' which gathers the main essence of the narratives while excluding speech disfluency; namely, unnecessary 'erms', 'ers', repetitions, coughs, pauses, etc. The data were then analysed using a two-stage process; being first coded into 30 thematic fields using an analytical grid/matrix, followed by analytical grouping and data reduction into four key themes: (i) post-16 qualification pathway; (ii) learner identity; (iii) preparedness for higher education study by qualification (mix); and (iv) student support post-16 and at university. The qualitative findings in section five of this report deal with these four themes in turn, each reporting on a complex nexus of interlinking facets that underpin each respective theme. The inclusion of verbatim quotations in section five are used primarily to deepen understanding and provide explanation as well as illustration (Corden and Sainsbury 2006).

4. Quantitative findings

4.1 Descriptive analyses

Before modelling our data, we first present a descriptive analysis of key relationships within the data. This descriptive analysis helps to better understand the data and inform subsequent testing of ideas through multi-level logistic regression in the subsequent section. The analysis begins with a description of variables and their central tendencies (either the mean or proportion in each category), which is given in Table 3. This provided an overview of the dataset and shows sufficient variation in each variable to permit analysis.

Table 3: Summary statistics for variables used in the quantitative analysis

Variable	Summary Statistics
Degree classification	First or upper-second class (68%), all others (32%)
Coded qualifications	Vocational (4%), Academic (91%), Mixed (3%), Other (2%)
Low participation neighbourhood	Yes (8%), No (86%), Unknown/missing (6%)
Gender	Male (44%), Female (56%), Other (< 0.001%)
Age on entry	Mean: 21.75 Years, Standard deviation: 6.2 Years
Entry tariff	Mean: 338.75, Standard deviation: 125.5
Part-time study	Part-time (1%), Full-time (99%)

The primary focus of the investigation is on how vocational qualifications relate to degree outcomes. This information is summarised in Table 4, which shows that just 51% of students with vocational qualifications receive a first or upper second-class degree, compared to 70% of students with academic qualifications. While these results appear to point to a strong effect associated with vocational qualifications, this interpretation is potentially erroneous, as it is possible that the difference is actually caused by demographic factors associated with vocational qualifications. These demographic factors are summarised in Table 5, which shows that demographic variables appear to be related to qualification types. Specifically, students with vocational qualifications are predominantly male (51% versus 44%), more likely to be from areas with low higher education participation, and are slightly older on average. Furthermore, the difference in entry tariff is over 80 points, indicating that the level of preparation for higher education is notably different between the two groups.

Table 4: Summary of qualifications groups and degree outcomes

Qualifications group	2:2 or Below	2:1 or Above	% of group
Vocational only	16,090	16,685	51%
Academic only	233,499	537,373	70%
Mixed academic/vocational	10,208	14,957	59%
Neither	8,728	8,906	51%
Totals	268,525	577,921	68%

For all these demographic factors, students with a mix of vocational qualifications and academic qualifications land between the academic/vocational only groups. This pattern demonstrates a consistent trend that validates the categories used in the analysis.

Table 5: Summary of qualification types by demographic variables

Qualifications group	Ent. tariff	Entry age	% Male	% LPN
Vocational only	262	20.8	51%	16 %
Academic only	342	18.8	44%	8%
Mixed academic/vocational	311	19.4	45%	14%
Neither	--	20.2	46%	17%

Table 6 completes the descriptive analysis by showing that these demographic factors are also associated with different degree outcomes. Specifically, those that are associated with vocational qualifications (i.e. a higher proportion of males, slightly older entry ages, etc.) are also associated with lower degree outcomes.

Table 6: Summary of student characteristics and degree outcomes

Variable	2:1 or Above	2:2 or Below
Mean age	18.85	19.03
Mean entry tariff	361.77	294.15
Percent male	41.84%	47.59%
Percent LPN	7.62%	9.59%

Thus, the descriptive analysis identifies relationships within the data and establishes a key question for modelling: Are lower degree outcomes associated with vocational qualifications attributable to associated demographic characteristics, or is there an independent effect that appears to be associated with the qualifications themselves? In other words, if we take two hypothetical students with the same demographic characteristics but different types of qualifications, are we likely to see a difference in outcomes that does not appear to be due to chance (i.e. a statistically significant relationship). Addressing this question requires a move beyond descriptive analysis to statistical models that test hypotheses.

There are clear relationships identified in the data: students with vocational qualifications are more likely to have a range of other characteristics (e.g. entry tariff, male, low

participation neighbourhood, etc.). Our key question for modelling is whether outcomes for students with vocational qualifications are lower when we control for these factors: If we take two hypothetical students with the same set of qualifications and demographic characteristics, are we likely to see a difference in outcomes that cannot be explained by chance alone (i.e. a statistically significant relationship)? It should be noted this model would not be designed to predict outcomes for individual students, but rather to test the hypothesis that there is an effect particular to vocational qualifications when we account for other background characteristics.

4.2 Statistical modelling

4.2.1 Model 1

Model 1 expresses the probability of a student in the dataset receiving an upper degree based on their entry qualifications and individual background characteristics described in section 3.2. Results show that controlling for background characteristics, the students with vocational qualifications were significantly less likely to achieve an upper degree outcome, than were students with mixed qualifications (although in this case the decrease in probability is smaller). The size of this effect is notable: the expected change in degree outcomes associated with vocational qualifications is much larger than that associated with low participation neighbourhoods, age, or gender – only the effect of part-time study is larger.

Table 7: Results from Models 1 and 2.

	Model 1	Model 2
(Intercept)	-2.69**	-2.64**
Academic qualifications (ref.)	(0.00)	(0.00)
Vocational qualifications	-0.69**	-0.71**
Mixed qualifications	-0.49**	-0.48**
Other qualifications	0.10	0.09
LPN	0.01**	0.01**
Tariff	0.00	0.00
Gender – male (ref.)	0.21**	0.23**
Gender – female	0.66	0.83*
Gender – other	0.08**	0.09**
Year	0.09**	0.08**
Age on entry	-1.75**	-1.72**
Part-time		
Standard deviations		
Intercept		0.408
N	764,810	764,810
BIC	862,488	854,278

* relationship significant at $p < 0.05$

** relationship significant at $p < 0.01$

4.2.2 Model 2

Model 2 extends Model 1 by introducing a random intercept for each institution. This compensates for overall differences in degree outcomes between institutions, as the proportion of upper degrees awarded will likely vary between institutions. The results follow the same pattern identified in Model 1, as the change in probability associated with vocational qualifications is negative. The goodness-of-fit is measured in the Bayesian Information Criterion (BIC), with lower numbers corresponding to a better fit; thus, the introduction of institutional differences into the model improves its fit when compared to Model 1. The standard deviation in institutional effects (0.408) shows that an institution will typically raise or lower the chances of an upper degree by +/- 3.3% (see Appendix 2 for translating effect-sizes to changes in probability).

Together, Models 1 and 2 provide a good test of whether there are differences in degree outcomes for students with vocational qualifications across the sector. Even controlling for demographic variables and institutional variation, it appears that there is strong evidence that vocational qualifications are associated with a decreased chance of obtaining an upper-second or first class degree. This effect results in a 0.714 decrease in the log-odds of receiving an upper degree, or in more intuitive terms a decrease in 3.3% of an upper degree. Models 3 and 4 continue the analysis by looking at how this effect – that is, the decreased degree outcomes for students with vocational qualifications – is related to institutional level variables.

4.2.3 Model 3

Model 3 extends Model 2 by adding random effects for vocational qualifications. This means that the effect of vocational qualifications – that is, the change in degree outcomes associated with vocational qualifications – is calculated separately for each institution in the dataset. The overall pattern of relationships is similar to other models: the “vocational qualifications” term captures the average effect of across all institutions, which is still negative when controlling for other factors. However, the standard deviation shows how this effect varies by institution: while the average change in an upper degree associated with vocational qualifications was identified as 3.3% above, this effect ranges from 2.4% to 5.9%, depending on the institution. Thus, the random effect can be considered a type of “institutional differential” representing how well students with vocational qualifications perform relative to the rest of the sector.

Table 8: Results from Models 3 and 4.

	Model 3	Model 4
Level 1 variables		
(Intercept)	-2.59**	-2.74**
Vocational qualifications	-0.71**	-0.55**
LPN	-0.08**	-0.08**
Tariff	0.01**	0.01**
Gender – male (ref.)	(0.00)	(0.00)
Gender – female	0.23**	0.23**
Gender – other	0.82*	0.82
Year	0.09**	0.09**
Age on entry	0.08**	0.08**
Part-time	-1.72**	-1.72**
Level 2 variables		
Research intensity		-0.01**
Post-1992		-0.05
Grad employment		-0.0
Standard deviations		
Intercept	0.406	0.405
Vocational qualifications	0.140	0.114
N	764,810	764,810
BIC	855,211	855,209

* relationship significant at $p < 0.05$

** relationship significant at $p < 0.01$

4.2.3 Model 4

Model 4 extends Model 3 by incorporating data on higher education institutions' research intensity, graduate employment rates, and pre-/post-1992 category. As with student background characteristics, these variables may well be interrelated: for example, it is likely the case that older (pre-1992) universities are more research intensive and also have higher levels of employability. Thus, the analysis identifies whether the independent contribution of each predictor (i.e. the association between the predictor and outcome that is not associated with the other predictors).

Results show that the probability of students with only vocational qualifications receiving an upper degree are significantly related to research intensity. For each percentage increase in research funding, the odds of an upper degree drop by 0.01 (meaning a total possible drop of 0.5 across the whole scale of 0 to 50%). Using the interpretation of coefficients given in Appendix 2, this corresponds to a drop of 2.5%. Other institutional predictors – namely, graduate employment and pre/post-1992 category – are not significantly related to the outcome variable.

4.3 Validation and further analysis

In order to validate our analysis, we undertook diagnostic procedures for logistic regression described by Greenhill *et al.* (2013), which ensure that higher predicted probabilities correspond to more frequent positive outcomes in the observed data.

4.4 Limitations and directions for future research

While the quantitative analysis provides a rigorous analysis of how degree outcomes vary according to student entry qualifications, the scope of analysis is focused and therefore entails certain limitations. First, the focus on degree outcomes does not include other important aspects of learning in higher education. For example, the analysis does not investigate retention and completion; our data include only those students who completed their degree. We also do not account for differences between subjects of study. This omission is partly pragmatic: the missions and foci that higher education institutions have means their subject offerings are also quite different. Therefore, combining an analysis of institutional and subject differences would not have been possible. However, both the topic of retention and investigation of differences between subjects and disciplines would be fruitful areas for further research.

4.5 Summary of quantitative findings

Overall, results from the quantitative analyses clearly indicate that students with vocational qualifications (most of whom completed BTECs) do not perform as well as others in their degree outcomes. Even controlling for related demographic factors, the changes in outcomes associated with vocational qualifications are statistically significant and of a higher magnitude than factors such as entry tariff and social class. The analysis also shows that the magnitude of this disparity differs by institution and tends to be more pronounced at research-intensive universities. These findings highlight the potential problematic marketing of the BTEC, which largely depicts BTEC graduates as succeeding in research-intensive universities.

5. Qualitative findings

5.1 Student focus groups

5.1.1 Post-16 qualification pathways

The qualifications with which students in the sampling frames entered university are set out in Table 1. While traditional A-levels were far and away the most common form of entrance qualification for students from each university (Table 1), participants (identified in this section by use of pseudonyms) were chosen to take part in the focus groups in order to represent the broadest range of entry pathway (i.e. qualifications), experience and academic discipline; which for the purposes of this study have been divided in to academic bandings (see Table 2) in line with predetermined HEA discipline clusters (see Appendix 3). Students were therefore drawing on their experience of studying for:

- internationally recognised academic qualifications that included the International Baccalaureate (IB), European Baccalaureate (EB), the baccalaureate of various national systems and the Cambridge Pre-U;
- an international foundation year, which enables degree programme entry for international students whose qualifications are not accepted for direct entry to an undergraduate degree programme or whose first language is not English;
- vocational qualifications that included BTEC, Higher National Diploma (HND), National Vocational Qualification (NVQ) – achieved through their role in a paid or voluntary position, Council for Awards in Care, Health and Education (CACHE), City and Guilds, as well as linked apprenticeships;
- an Access to Higher Education Diploma, where students had entered without traditional qualifications and/or had been out of any formal education for some time;
- a combination of the above. Several students in each focus group possessed different types of qualifications – most often, though not exclusively, BTEC and A-level. This reflected the relatively high numbers of those in the sampling frame for the post-1992 university that had entered HE with a mix of academic and vocational qualifications (see Table 1).

It would be easy to assume that post-16 pathways are determined solely by GCSE or equivalent (exam) results, those doing less well opting for more vocational routes where they have not met the requisite grades. However, thinking in terms of a straightforward academic versus vocational progression through notions of academic ability alone can act to mask an array of factors that can influence decision-making and student ‘choice’. As Molly explains:

I did OK in my GCSEs, so I didn't choose [my BTEC] from that aspect ... I was almost going to choose A-levels, but I chose [the BTEC] because there weren't enough A-levels that I really wanted to do.

Students spoke not only of their qualifications, interests and skills but also of the desire to move from a school setting to a college one as having influenced their decision to opt for a vocational qualification. Sometimes, these choices were determined in discussion with parents and schools, though students spoke also of the influence of friendship groups, where arguably a certain amount of ‘collective’ decision-making appeared to be taking place.

The notion that different pathways represent default ability levels, can serve to reinforce the notion that one type of qualification is superior to another, whether or not they are, in theory at least, of equal value in respect of the UCAS point system. The type of secondary institution attended could also send important messages to students about appropriate pathways to HE. For those taking the IB and Cambridge Pre-U, these were often the only options if they intended to stay at school sixth form. For David and a number of other A-level students, they were unaware that other non-A-level pathways to university existed:

I didn't know it existed before I came to university. Before I came I thought the only way that you could get in was A-levels. I didn't know the universities looked at other stuff. That's just because no one told us. Then, when I came here I realised, of course, yes, it makes perfect sense.

Whether a greater range of qualification options would have influenced the decision-making of these students is a moot point. However, there were indications that where an element of choice existed, some students would avail themselves of a mix of qualification pathways in order to maximise their chances of obtaining the necessary entry points for accessing higher education and/or their university of choice; in particular where exam technique was perceived (by themselves or by their schools) to be weaker.

In 2014, UCAS reported a fall of 2,500 among students starting university in England with A-levels grades of AAB+, while the number of those with grades equivalent to ABB+ rose by 4,840, accounting for around a third of all “high tariff” university entrants (UCAS 2014b). Though not fully explaining the rise in university intake of vocational qualifications and concomitant fall in those students arriving with high A-level grades, such accounts may partially help to explain these recent figures. In particular, given the increase in students who hold at least one BTEC being driven by students holding a mixture of qualifications (UCAS 2014b).

5.1.2 Learner Identities

The students' exchanges highlighted how perceptions of different qualifications mattered, not only for themselves but also for their peer groups, the schools they attended and for the admitting universities. That a perceived hierarchy existed among the student population across the board was not in doubt. As Rita explained:

I think A-levels are more respected. When I was at college, when people would ask me what I do and I'd say, 'I do a BTEC,' people would be like, 'That's not a real thing. That's not as hard as A-levels.'

Qualification status appeared not only to exist across a perceived academic–vocational divide but among these two broad groups themselves where, for example, IB or A-level students felt they had taken a more rigorous pathway than the other. This occasionally led to jostling for pole position within meetings. Those with vocational and mixed qualifications also took views on this, as reflected in this exchange between Alison and Rita:

Alison: When I was at college, IB was viewed as less than A-levels ... My housemate did an IB and just the other day someone was like, 'But that's not like A-levels. That's not real. That's not as good.'

Rita: A lot of my friends all went to a school where you could only take IB and it was a very academic, prestigious school to get into, so my perception was that they were very hard. She's now at Cambridge, so I've always thought they were really difficult.

Paul, explained that at his Grammar school in the south-east of England, they used to run the IB alongside A-levels but that they had now adopted the IB as their only pathway.

When you get to sixth form, they used to offer either you're A-levels or IB. Now they just offer IB. The school used to say in assembly, 'You should do the IB,' because they wanted people to do it. They perceived it to be the better one, but whether it was or not, I don't know.

This talk of academic subjects being more rigorous could lead to a certain defensiveness on the part of students with vocational qualifications. One student pointed out that with his D*D*D*, he probably had more UCAS points than anyone else in room.

Nonetheless, this perceived hierarchy was felt to exist not only among peers but, more importantly, in the admissions policies of some universities. Ginny, for example, felt that she had been excluded by an elite university due to her BTEC being part of her overall qualifications profile, despite having a triple distinction:

I could only apply for a university that accepted UCAS points. [My current University] was my second choice. My first was [a Russell Group University] and I really, really wanted to go there, but they said, 'Because you're doing a BTEC, you can only come here if you get an A in your psychology A-level.' ... I was a mark off. ... [I had a] triple distinction. So, I was very over-qualified to come here ... because I did the equivalent of five A-levels, so I've got almost 400 UCAS points. I only needed 280 to get in [to this university].

Having come through the same pathway as someone else could lend a certain camaraderie or sense of community among students, as Steven explained:

I love to hear when there is another IB person in the room. It was a good way to make friends at the beginning as well, because that was the hot topic – 'Where do you live and what did you study?'

5.1.3 Preparedness for higher education study by qualification (mix)

How well students felt their qualifications prepared them for HE linked primarily to the way their respective degree programmes were assessed. Specifically, how they perceived that the 'skill set' they had developed prior to entering their programme had helped them to 'succeed' relative to the different forms of summative assessment they were party to, including: exams, written assignments, reports, individual and group presentations or combination of these.

For the majority of students in all the focus groups there tended to be a mix of assessment type, though for some students at the post-1992 university, exams did not feature on their degree programme at all.

For the Cambridge Pre-U and the IB students, the requirement of an extended essay was felt to have been very good preparation for university, not least as it had introduced them to the Harvard referencing system. Tara, explained that:

For most people that was the most academic piece of work that they'd done before uni. Basically, the Pre-U distinguishes itself from A-levels and stuff like that, because there is a lot more breadth and more of a focus on independent learning.

An international foundation year student, Christoph, explained that:

[The Foundation Year is] basically to equip us for uni. The exams and all that was pretty similar to how it is in uni, so when I came here it wasn't that much of a difference. I was OK with it. The workload, too, was pretty similar. So it was very uni-like.

Those students coming through an IB, Access to HE, and Cambridge Pre-U route, in the main, all felt well prepared in terms of essay-based and presentation-based assignments. Rob, a mature student in his 30s, explained how his Access course had been “all essay-based and presentation-based” and was therefore very similar to his first year of university study. He explained that the university worked in partnership with the Access college he attended and suspects that was why his Diploma prepared him so well for study at HE. He also explained that while he was part of a key group of 30 students during his Access to Education Diploma, there was often some overlap with up to 140 students following other streams, such as Nursing. He felt this mix of student background in terms of subject discipline and, by definition, age had also helped him develop the skills necessary for study at university.

Perhaps counter-intuitively, many A-level students were not so positive about how well A-levels had prepared them for assessment. In particular, they indicated that they had not expected or been prepared for the levels of assessed group work they experienced as part of both the formative and summative assessment within their programmes of study. There was a sense among numerous A-level students that approaches had consisted primarily of being able to memorise dates and key studies that could then be repeated. As one student indicated “you just learnt what you were told and wrote it in the exam.” As a result, some felt they lacked the requisite skills in terms of researching given topics.

On the whole, those who had arrived at university with a mix of qualifications felt they had experienced the best of both worlds. Rita highlighted how modules in the second and third years of her programme were a combination of exam and written assignment. She explained how:

[The BTEC] prepared me well, because it was all coursework-based, whereas Psychology A-level, that was just an exam. So, if I'd just done A-levels, I'd have come to university never having written any essays, which would not have helped me at all, because first year was all essays. I didn't really have any proper exams until second year. So I would have had to go straight into essays never having written it before. So, I think my BTEC prepared me better in that way. But, then, if I had only done my BTEC, I wouldn't have any experience with exams at a higher level.

Josie also felt this mix of academic and vocational courses was helpful, not least in that the practice based approach of her NVQ and subsequent HND gave her an insight into the topics she was exploring at university that she would never have got from A-level study alone:

You have to know what you're talking about as well as being able to write about it, whereas when you're doing A-levels they tell you the information and say, 'Write about this, when you're asked about it'. But here you have to have the practical and the academic side as well and you have to be on par with both of them. When I did an HND, it tied it in together more ... 'Well, actually, what I found was very different to the theory ... You can actually physically say, 'I was there, I saw it with my own eyes, I'm not just taking what someone else told me for truth.' So, you're in the centre of it rather than standing outside, looking in.

Those students that had taken a linked apprenticeship spoke not only of the importance of developing life skills but of having a wage.

Some of those coming through a vocational only route felt that there was a danger of not being pushed hard enough. For Molly, it had worked as she had determined very early on that she wanted to come out with a distinction level:

I don't think they really push you enough either, because I did it and said, 'I'm going to do this and I want to come out with a distinction at least, because I don't think it's worth it otherwise,' whereas there were people who were just happy doing a couple of paragraphs to get a pass, but they didn't really push you further; they'd let you do that.

Linked to this, there were issues around the jump in workload. This was an issue for all students who talked about it but in the main tended to affect the BTEC students more. John highlights how he found the transition difficult:

I found it really intense, because BTEC was three days a week. There was not a lot of work to do. I joke around saying it was the easiest two years of my life. So it was a big step up for me. I was a bit shell-shocked the first two weeks.

The workload issue was directly linked to independent learning, and the second year (pre-1992) group tended to talk about 'independent learning' as having been the biggest change and challenge.

5.1.4 Student support post-16 and at university

Students from the post-1992 spoke about the high levels of support they had received in respect of academic writing skills, though recognised this may not be the case for everyone.

Rob: The first few lessons were going through, 'This is how you need to structure your essay.' It was very well explained to you and taught, 'This is what you need to do, this is where you need to look, this is the path you should follow or shouldn't follow, this is where you should look for the information, this is how you do references.' So, I felt, from the early education first year, from the first few lessons, definitely the first month that's what I got from that.

These sentiments were expressed by others including Josie:

I found we were really well-supported here. I want to make a comparison between doing my A-levels, which was literally, 'Write an essay about this,' or doing an exam and it was just, 'Learn what we've talked about.' ... I didn't get very good grades [for my A-levels] ... but no one had told me how to structure it all or reference it or anything like that. Whereas here, even with dissertation, it's like, 'This, this, this, this and this many references,' and you can go, 'OK, that looks so easy now.'

In terms of extra-support for disability and learning support, Rob, who has dyslexia, pointed to the importance of creating an 'open culture' around any sort of disability:

generally just being quite open and honest about my disability ... generates a lot of peer support ... I suppressed it through primary and secondary school with no support and even through my Access course, no support really. They helped me get a post-16 statement, but, other than that, that was that. As soon as you came here and right from your UCAS application, it was like, 'OK, we're going to help you through DSA [Disabled Students Allowances], you come in and you have a meeting and see what you need, if you need any additional support,' which was really good

here. Then I felt really open about that, speaking to all my tutors, if my writing is bad or is not right, then there might be a reason for this. It's not used as an excuse [but] then a lot of support came down from that, from a lot of people around as well.

However, despite being very positive about the support itself, which derived through *Disabled Students Allowances* (DSA), Rob who is a third year Education student who had come via an Access route, did not make best use of these allowances and services during the second and third years of his programme due to a lack of flexibility as regards timetabling. As a mature student with joint childcare responsibilities (shared residence) for his children with his ex-partner, he felt that accessing the DSA could have been made more flexible as far as timing was concerned, particularly as he had a long commute to and from the university.

5.2 Academic staff interviews

The staff interviews offered insights into how aware tutors were of the range of entry qualifications students might be arriving at university with, how students were perceived to be faring within their respective university departments due to any differences in the 'skill sets' they were arriving with, and how any discernible differences might impact teaching approaches and the different kinds of support made available to them, whether this be explicit or implicit support. Recruitment took place on the basis of participants (identified here by use of pseudonyms) being able to offer insights from a range of perspectives deriving from a combination of teaching, pastoral and/or administrative roles (e.g. admissions tutor).

5.2.1 Tutor awareness of students' education pathways

While participants were aware of the education histories of some students who they came into direct contact with in relation to specific non-teaching duties, on the whole they were unaware of the general education pathways that their students had taken. Indeed, there was a sense that knowing this was unnecessary in the context of their teaching practice as Adileh, a lecturer and admissions tutor for an undergraduate Social Science programme in the pre-1992 university, highlights:

If they meet the admissions criteria that's it and it's not something that would be thought about ... We don't make an issue out of it.

Barbara, who works in the post-1992 university, felt that it might only serve to "blur the issues", at least within the context of second and third year student cohorts:

I just see my group as my group. It might be more pronounced for those tutors teaching the first year programme, because that's where a lot of the foundation work goes in, in initiating them into higher education and academic study. They may be more aware.

An understanding of student pathways appeared to be based more around general knowledge of student entry requirements and overall differences in participants' respective university student populations in terms of traditional versus non-traditional routes to HE; pre-1992 being more likely to accept those from academic routes, post-1992 more open to a wider range of entry qualifications linked to entry tariff. Nonetheless, all participants conceded that specific numbers were likely to vary according to particular degree programmes.

Colin, a teaching fellow on a degree programme within a Health and Social Care programme in the pre-1992 university, explained that in his previous role as admissions tutor, he would see every student application form but that admissions over the past few years had become a much more centralised exercise. As a result, the only forms he would now see were those where the predicted grades were on the entry tariff borderline:

whether they're doing BTECs or A-levels or a combination, if they are predicted to get what we ask for, I don't see the form. So, from an admissions tutor's point of view, the role has changed ... It's now more of a marketing ambassadorial type role.

Adileh described the numbers coming through vocational and access routes as 'very low'. She explained that in her three years as an admissions tutor she could not recall having ever accepted a BTEC only qualification; where students coming through this route had been accepted, it had been done so in conjunction with A-levels. She pointed to the local post-1992 university as also providing an undergraduate Social Science programme and that students coming through a vocational route were more likely to go there.

Deanne, a lecturer on a STEM degree programme as well as the Quality and Diversity Officer for her Department in the pre-1992 university explained that despite their A, A, A* entry requirement, courses were generally fully subscribed with students that met the qualifications criteria, leaving little room for those with alternative qualifications. Indeed, in the previous intake this had allowed for only four places out of a total of around 100 to be flexible to widening participation. She indicated that it was something her department is aware of and that relevant meetings had been taking place in order to discuss how they could proceed:

in order to balance the fact that we don't want a homogenous class of students, so they have some flexibility [with an entry requirement that] puts us on the level of Imperial and Cambridge.

Adileh, explained that while the university does have targets for widening participation, in her experience they are negligible:

Every year we'll have at least two or three out of a total of around 75-80 students [coming through an Access route].

She pointed to similar concerns about not having enough students from minority backgrounds in the university's student profile:

It could be because all universities now, because of the hike in tuition fees and the competitiveness of appearing to be offering the best, everybody's aiming so high that, inevitably, we will overlook students coming through vocational routes or ethnic minority backgrounds simply because our eyesight is focused on high entry grades, which will attract a particular profile.

Jenny, working on a Social Sciences programme in the post-1992 university indicated that they also had a low ethnic minority profile:

We do have students from other ethnic communities, but compare it with some of the inner city universities that I've externally examined, it's a very white university.

For Paul, also teaching at the post-1992 university, the issues were more around “local proximity and social class and gender, I think those three things interact quite importantly.”

Paul explained that his university was “exceptionally white” and that “recruitment of international students is driven by Masters numbers, [and so] limited at the undergraduate level on our programmes.” As a result, he felt it was difficult to discuss ethnicity in relation to the issue of qualification pathways at his university given such limited numbers.

When asked about international students, Adileh explained that she is allocated a number of international foundation year personal tutees, whom she described as primarily European and therefore entering with a standard school baccalaureate. She explained that as international students who can afford to come and study abroad, they will often have gone to private schools and therefore ‘by definition’ of being international, be less likely to have undertaken vocational type qualifications.

Another issue raised by Adileh, was how programmes across the university were being marketed to those coming through vocational programmes of study. She explained that, in the main, university prospectus information as regards entry grades for prospective students were generally marketed as A-levels, and that while marketing does stipulate an IB equivalent, other accepted qualifications were not generally made explicit. Potentially, this could mean that students coming through vocational routes such as BTEC are unaware that they are eligible to apply. In this respect, Adileh pointed to the potential for tension between “a widening participation agenda in the university” and a “central marketing and communications” apparatus that advertise their courses:

These are things that marketing would lead on, because you know the university is very standardised; all departments have to have exactly the same page, words on a page, it's all got to look the same.

The above narratives taken on their own could give the impression that the pre-1992 university as a whole might not be as receptive to vocational level entry as they might be. However, it became clear through further discussion with other participants that it was often more a question of the degree programme itself. Andy, for example, who teaches on a Health and Social Care programme at a pre-1992 university revealed that anywhere between 35% and 45% of their yearly intake were coming through a BTEC route, albeit requiring a D, D, D profile. Having recently taken on the role of admissions tutor for this programme, he explained that, in general, BTEC students met this criteria and so any queries he would be party to, usually concerned A-level students.

The post-1992 university participants tended to be more aware of the likely mixture of vocational and academic qualifications students were arriving with. Michael, for example, teaches on five undergraduate modules in the Social Sciences, including those arriving in the third year of a ‘top up’ foundation degree (i.e. converting a two year qualification into a full Bachelors degree). He is personal tutor for between 20-30 students from very varied backgrounds and himself has a teaching background in further education (FE). He described the degree he teaches on as having both an academic and professional orientation, with many of their students wanting to go on to become primary school or early years teachers, to go into professional roles in schools or into other educational environments. He sees the programme’s role as attempting to marry those two things together:

it's not an easy thing to do, particularly when there are some students who really do want to look at things thoroughly, academically and critically, whereas others are very much, at the back of their minds, thinking about what's going to be best for me in terms of getting that first job or getting onto the PGCE, that kind of thing.

He pointed to the importance of striking a balance between these two aspects within his programme and believes they as a department are not alone, in that this is increasingly the case for many higher education courses.

While participants had a fairly good understanding of their respective student bodies in terms of the types of qualification(s) they would be arriving with, the more specific lack of awareness of individual students raises the question of whether knowing would be beneficial or not. Unless it was raised by the student themselves or where, in the case of the post-1992 university, students entered the third year from a partner FE college, it went largely unnoticed or commented on. The issue of third-year entry was remarked upon by Barbara, who teaches on an undergraduate Social Studies programme:

I wouldn't know which entry route students have taken unless they tell me. It's usually in the context of wanting to go into [further] training. So, then they would raise that concern, 'Have I got the right qualifications to progress ... ?'

In this instance, there are practical reasons why knowing early on would help, namely, where the statutory requirements that students require for further training are a grade C or above in Maths, English and Science. Where students have come in through non-traditional routes then arguably the sooner tutors are made aware, the sooner any relevant advice can be given or support put in place. The argument is of course one that students should be taking greater responsibility for finding out what is required and that it is not the role of the lecturers to do this. However, given the multiple roles of academic members of staff, not least pastoral ones, one could ask who the student should go to when seeking advice of this nature. Barbara points to the challenges this raises for academic teaching staff.

I think for some staff there's that challenge of, '... should we just be teaching our discipline and that's that? It's somebody else's responsibility to ensure that students are ready.' ... I would see my role as a teacher to help students overcome those barriers, but other academics might take a different [view].

The case for knowing may be made stronger where international students are concerned. Barbara conceded that it might be helpful to know more about the qualifications they arrive with:

I should be [more aware], but I'm afraid I'm not. Again, yesterday, I have a student, she's come from the foundation degree, she did her schooling in France, she's been here in the UK for two years, but she was querying whether her baccalaureate would be sufficient to get her onto [a] PGCE. I don't know the answer to that, so we're both going to do a bit of research around that.

Indeed, Barbara explained that knowing is something the university actively encourages through the widening participation office.

Adileh explained how the majority of Access students she came into contact with tended to be mature female students with children:

“so mums, typically, coming back into education” ... all the ones I’ve known have got children. Actually, one of our professors came through Access. But, as far as I’m aware, once they come here, once they’re among our students, we don’t single them out in any way. They tend to be among the highest achieving students.

The general consensus among participants was that it is important for staff to be aware of changes in entry qualifications, particularly in the vocational arena in terms of the structure of qualifications and modes of assessments, not least because it affects the students’ expectations of learning, of assessment, and how university is going to be for them. A greater awareness could lead to tutors being better prepared for individual students. Part of the problem with this approach of course is numbers of students, as Michael explained:

I’m teaching on modules that have 100, 200 [students] ... So the potential to differentiate, if you like, for individual circumstances, we only have so much time and resources to do that. We do our best, but there are lots of people, academic support staff as well, around who can, who make themselves available and publicise their services, academic writing, that kind of thing. So, that is also very important, I think.

5.2.2 How students fare

In the main, it appeared that the different pathways students had taken to university had not influenced teaching styles or approach, primarily because participants felt the skill sets, which all students were arriving with, were sufficiently broad to deal with the rigours of academic life, whatever route they had taken to get there. Moreover, in their personal experience, participants indicated that those coming through a non-traditional route could often make some of their best students. As Michael highlights:

I actually think that a lot of people who come from that kind of background are often quite industrious, quite rigorous, quite used to change, in many ways, or having to change. You often find that, actually, those that put the effort in come out as being actually very good students.

These sentiments were echoed across the board. Adileh, for example, explained how in the context of Access students:

They tend to be the student reps, so they’re very much leaders. We call upon them in open days and talks, because, by the nature of being mature and all of that, they present themselves well, they can engage and they’re leaders. So, actually some of our best students come through Access.

Deanne indicated that, in general, the weaker students tended to be the international students who could struggle with memorising a lot of vocabulary when working in a second language.

While they often pass the numeric classes with flying colours, their language skills can let them down which can lead to exam re-sits.

Participants had generally not given much thought to how students might perceive their own or others’ learner identities. In general, they described very positive atmospheres within their classes. They spoke about university life being about welcoming difference and diversity of background and perspectives. That the process of university education was in fact all about challenging people’s assumptions. As Michael explains:

because they're coming up against experiences of life, experiences of living in different places, different ways of thinking that maybe they hadn't come across previously. That's all part of being at university ... So, assumptions are constantly being challenged and people are constantly reframing the way they're thinking.

Participants felt that programme assessment played a large part in how well students from different educational pathways fared. Programmes that relied solely on written coursework and group presentations with no exams, could be a particularly 'attractive' option for vocational entry students as well as those coming through more traditional academic routes:

I think people who have gone through certain kinds of qualifications where exam-based assessment is marginalised or has been taken out of the qualification completely, they might be quite reluctant to apply for [certain courses]. I don't know if struggle is necessarily the right word, but they might find they're more problematic, simply because they're not used to them and there is a kind of fear for some people of this notion of the exam.

Michael explained that some courses have more exams and that others, such as his own, did not have any and there were not any plans or discussions on any level seeking their inclusion. He conceded that there may be some benefit in his education studies students having some exams, because very often the students go on to work as teachers and will therefore have to teach to exams or timed tests of various kinds quite early on in their educational career.

Most of the courses described by participants also had an element of assessed presentation through group work, which – it was argued by one participant – could mean that they were very much geared towards making themselves open for people who come from vocational backgrounds.

I think, in some ways, there is a distinction ... between people who come through more of a vocationally-orientated FE college route and people who are coming through a school route. I think there are some differences there, because of the ways that colleges operate. It depends which, because FE colleges are quite different in different parts of the country as well, which is something that is not always picked up. You've got some places that are big post-16 sixth form colleges, which generally have a very different environment from your standard FE college. Some people who have come from that more general FE college route, have been doing vocational qualifications, a lot of them then go on to do college-based foundation degrees, some of them may be coming into universities like ours and the first year of full-time undergraduate degrees. I think there is, maybe, a slightly different expectation in terms of what the course is going to be like and how they're going to learn through it. But I think it's very difficult to generalise.

Although no students taking part in the focus groups had come through a foundation degree, the issue was raised that some students progressed to the university through a partner FE college in their third year to 'top up' to an honours degree (e.g. teaching assistants and early years courses). In the main, they were described as mature students who may well have gone through Access courses and were on day release. Barbara explained that these students often 'stand out' because of their lack of academic understanding, principally in relation to research methodology. She explained that, since they are all in work and want to look at their workplace for their dissertations, this can lead to an overreliance on action research:

I don't want to diminish the role of action research, but that tends to be the dominant research instrument that they're using ... Many of them have been taught that research is action research and nothing else.

Barbara raised the prospect that students might be receiving mixed messages from partner colleagues in terms of academic writing skills, in particular in relation to the use of the sources that students are expected or indeed allowed to use.

I find that the foundation degree students have a very narrow approach, quite vague in what they're wanting to do, a tendency to repeat what they've done before, because that was safe and they've had an element of success in that. Then their research skills aren't quite as developed as maybe our own students would be.

There was a sense that students coming from a college route, may have a particular expectation around how learning will be organised at a higher level and the kind of support that will be offered to them.

You do sometimes find that students who come through that route are quite dependent on information that's provided within the sessions, because they're quite used to that way of operating ... sometimes they need to be encouraged to think more independently and to develop their own perspective.

Several participants spoke of the need to be aware this and to find strategies for trying to encourage those students to learn in slightly different ways or to extend or develop their skills in learning in a more independent way; finding other ways of developing their own perspective on the subject matter.

Equally, participants indicated there could be a tendency for those who come from more traditional academic backgrounds to continue to learn in that kind of way without necessarily extending and pushing themselves.

Michael highlighted the pros and cons of placements for students coming through a vocational route. He explained that while they have placements for those taking a 'specialised' route to a PGCE, for example, there was not a placement year as such. He thought there may be a tension there between developing people who are going to be really reflective practitioners and developing people who are just there to get the qualification, to get the next step in a career progression.

Now, you could argue that people who have been through more vocationally-orientated routes at school are better equipped, possibly, to handle that kind of way of working and learning, because sometimes they've had work experience opportunities or mini placement opportunities as part of their level 3 qualifications ... they very often become more adjusted to the world of work, if you like. Their expectations of what's acceptable and not acceptable within the workplace are, maybe, already there. ... That can also be a problem. It's not necessarily a good thing, because they may be less equipped to think critically about what's actually happening in those workplaces, because they may be already socialised, if you like, to that way of working ... you could argue that, once people become quite socialised into those particular environments, it's quite difficult for them, sometimes, to step back and say, 'What's wrong with this school?' or, 'What's wrong with the way things are working in this early years?'

5.2.3 Impact on teaching approaches and support

The generic resources and support available at both universities were primarily in relation to academic learning and writing skills centres, where courses, workshops and one-to-one sessions ran throughout the academic year. The level to which it would be down to the student to seek that support, as opposed to being initiated, varied among tutors and departments. In general, tutors indicated that it would be suggested or recommended as part of student feedback on assignments.

In terms of student retention, Barbara indicated that as an undergraduate programme they “do quite well”, with those that do leave, generally doing so in their first year through feelings of “homesickness”, “not feeling they fit in” or “taking the wrong course”. From conversations that had taken place between Barbara and her students, there were instances where students went on to defer for a year or to leave the university but there was nothing in her mind to suggest that retention was linked with entry qualifications in any way. As far as the foundation degree students coming in for their final ‘top up’ year were concerned, attrition was said to be minimal due to the high levels of support they received. In order to address the loss of students following the December vacation, Barbara explained that the post-1992 university had changed from semesters to year-long study but, partly in light of a growing international student base, there had been discussions about going back to semesters.

Links with feeder colleges for the foundation degree students were said to be strong and have been there for some time. As such, the foundation degree and top up Level 3 ran ‘smoothly’.

The students that I’ve taught, who’ve come through that route, have been, generally, very prepared to learn. As I say, there might be some kinds of expectation issues around directing people to content and how specific we are about expectations in terms of assignments and things, the extent to which they’re given or they understand the need to develop their own space to think critically about subject matter... I think there are issues that, maybe students who’ve come through the first two years of the degree have had more time and space to develop in a university environment. I think that could be an issue, but I don’t want that to be in any way a criticism of what’s happening in the FE sector.

In terms of helping students during their ‘transition period’, Michael felt that better integration between further education and higher education was required, whether that be in the first year or post-foundation. His argument was not so much about putting more resources or funding into academic support within HE itself, as much as developing a culture of relationship building between FE and HE in order to create a supportive environment.

I’d like to see, ideally, much greater collaboration between what we’re doing at a higher education level and what people are doing in the colleges. That has worked in other FE–HE partnerships in the past. I think the current funding environment, institutional environment in higher education and in FE is actually militating against that; it’s actually making that kind of collaboration more difficult. I think it’s a great shame, because I think a lot of FE practitioners would like to work more in that way, would like to have stronger collaboration with HE, providing it’s not done in a patronising way, which I think sometimes it has been done in the past. I think HE could also benefit from it, because there are many things going on in further education colleges which could help [those] in HE better understand how to support certain types of students.

Michael explained that his students aspire to a range of occupations, including social work, youth work or work in international organisations or education administration and management but that a majority aspire to be primary school teachers or work in early-years settings. As a result, tensions could arise in his own teaching practice between developing reflective practitioners who aspire to be really good teachers and think critically about what is being demanded of those working in the education sector and supporting them in making sure that they get the jobs that they want and ‘deserve’.

I think part of the problem with having fairly professionally-orientated routes through the degree is that you can sometimes find people are adjusting to fit in with what are sometimes quite

instrumental frameworks that are being set by external authorities. So, for example, in our case with teaching, the government: we've got things like the Teaching Standards. So, while we are encouraging people to think critically about the Teaching Standards and think about what it means to be a good teacher outside of the policy context, you know about that pedagogic relationship and how important it is and how we can sustain it at the time. At the same time, these people are often thinking about, 'How am I going to meet the Teaching Standards in order to ensure that I get the job that I want to get; ensure that I'm going to be hired as a new primary school teacher?' or get a place on a PGCE, if they don't have a place already.

5.3 Summary of qualitative findings

The qualitative analysis paints a complex and nuanced picture of how vocational qualifications prepare students for higher education. In particular, it reveals the importance of avoiding a deficit model when thinking about vocational qualifications. Both students' self-perceptions and the views of staff show that students bring a wide range of different experiences and learning abilities to their higher education studies, and that all of these abilities can be useful in helping them to succeed. The data indicates that students with vocational qualifications are highly capable, and possess qualities of confidence, interpersonal skills and a sense of agency that can help them succeed at the highest levels within the higher education environment. This suggests that universities might better support their learning.

5.4 Limitations and directions for future research

While the qualitative analysis provides a rounded account of the views of students and staff members concerning preparedness for higher education by entry qualification and the challenges encountered as a result, the small-scale nature of this part of the study was intended purely to help explain and add depth to the macro-level patterns identified through the qualitative data. In particular, a wider spread of universities would have helped to better capture the part played by ethnicity. Moreover, it would have been helpful to have the voices of foundation 'top up' students included in the final year focus groups given that their 'transition' to a higher education institute would have been different.

6. Conclusion

Taken together, the findings from this research present an interesting and complex picture of outcomes for students with vocational qualifications in higher education today.

Quantitative analysis shows that across the sector, students with vocational qualifications (who predominantly hold BTECs) are less likely to receive a first or upper-second class degree, even controlling for relevant demographic background characteristics. Furthermore, differences in outcomes are largest at research-intensive universities, where there are fewer students with vocational qualifications.

However, results from qualitative analysis paint a far more nuanced picture; the voices of students show that those from vocational pathways can feel more independent, self-motivated and capable than their counterparts with A-level qualifications. They are also aware of a clear hierarchy of qualifications, both within their peer groups and across universities to which they apply. Consistent with the findings of Ball, Maguire and Macrae (2000), the choices they make regarding qualifications are complex and not necessarily shaped by academic ability, but rather a combination of interests, dispositional qualities, and the influences of peers and families. Although students experience this hierarchy, its rules and structures are not necessarily clear or easy to navigate – those who can do so may be at a distinct advantage in higher education.

The views of both students and staff suggest that, above all, it is important to avoid a deficit model when thinking about vocational qualifications. Both students' self-perceptions and the views of staff show that students bring a wide range of different experiences and learning abilities to their higher education studies, and that all of these abilities can be useful in helping them to succeed.

On a broader level, the results indicate that there is a continued need to examine how choice in secondary education relates to the reproduction of social inequality. While they are posited as a flexible option for entry to higher education, both the qualitative and quantitative evidence in this project suggest that an engrained qualifications hierarchy exists, and that a successful approach to university study may rely on students' abilities to decode and navigate largely unwritten rules. It is important to note that these rules themselves are changing: the growth of the International Baccalaureate as a comparatively elite qualification is one example of how the landscape of qualifications is changing. Another might be seen in the increase in students opting for, or being advised by their schools to pursue, a qualifications mix (BTEC/A-level) in order to maximise their chances of gaining a higher tariff profile than might otherwise have been the case through a purely academic route alone.

Successful strategies therefore depend not only on knowing the rules of the game, but also decoding how the rules are changing. More transparent evidence on long-term outcomes from students with vocational qualifications (or mixed qualifications) are therefore essential to creating an equitable and fair education system.

6.1 Recommendations

In relation to the wider landscape of secondary and higher education, the study holds a number of important implications relating to the marketing and regulation of qualifications,

support for student success in higher education, and widening participation in higher education.

First, the findings indicate that the marketing of qualifications should be more closely regulated. This does not appear to be the current trend, as BTECs do not figure at all in OFQUAL's 2014-17 plan, and critics have pointed out that BTECs receive less regulation than A-levels (OFQUAL 2014; Grove 2014). If higher education institutions are held accountable to market forces through the disclosure of key information, then it would make sense for the same to be true of entry qualifications. Marketing for the BTEC suggests that the most likely progression route is a research-intensive university, but previous research shows that this is not representative of patterns in access (Hoelscher et al. 2008), and this study shows that they are less likely to perform well academically while there, while simultaneously highlighting their academic potential and abilities.

Second, entry qualifications should be taken into account as part of efforts to monitor and promote student success at the national and institutional levels. As part of its National Strategy for Access and Student Success in Higher Education, the Department for Business, Innovation and Skills (BIS) plans to monitor and report on access and retention among students according to "particular characteristics" (e.g. gender, disability, and ethnicity). The results indicate that monitoring the success of students with vocational qualifications is important to ensure equitable opportunities for education post-16.

At the institutional level, tutors should be more aware of the different ways in which students are prepared for higher education. It is important to note that our qualitative findings emphasise the many skills and abilities vocational entry students possess, suggesting that they can be successful in conducive academic environments. While it is not feasible that tutors would be familiar with the details of all secondary qualifications, tutors can be made aware of the range of qualifications their students hold and what this may entail in terms of student expectations, work patterns, and familiarity with different forms of assessment. This awareness should be promoted through centres of teaching and learning within universities and supported by the Higher Education Academy's disciplinary clusters, leadership programmes, and staff enhancement events.

Third, widening participation efforts should be informed about differential outcomes for students with vocational qualifications and use this information to help guide students. This should include tracking outcomes across courses and also surveying the assessment methods used in different courses. Sharing practice through the National Networks for Collaborative Outreach may help to promote good practice in this area.

It is important that all initiatives to improve higher education outcomes for students with vocational qualifications do not start from a deficit perspective, but instead recognize the capabilities and academic skills these students possess and leverage them to promote their academic success.

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Appendix I: Qualifications coding scheme

Academic qualifications

Academic qualifications – Traditional academic			
GCE A-level	6,979,465	GCE ASlevel (Double)	55,788
Advanced Subsidiary	6,585,986	Irish Leaving (Higher)	45,435
SQA Highers	1,115,339	Welsh Baccalaureate	36,867
SQA Intermediate 2	293,625	SQA Higher National Cert	34,240
GCE AS Level	292,754	SQA Higher National Dip	27,738
SQA Advanced Highers	261,284	AQA Baccalaureate	14,190
Int. Baccalaureate (Higher level)	129,275	GCE A-level (H2)	6,730
IB Standard (Subsidiary) Level	120,436	GCE A-level (H1)	4,422
GCE A-level (Double)	82,850	GCE A-level (H3)	1,278
IB Total points	70,937	GCE Special Paper	1,188
IB Overall result	58,732	SQA Intermediate 1	1,133
IB Theory of Knowledge	58,463	GCE 9 Unit Award	1,131
IB Bonus points	58,396	Scottish Baccalaureate	907
IB Extended Essay	57,886		

Traditional academic – Arts academic			
Music Practical Level 8	16,222	Level 3 Certificate in Speech and Drama	295
Music Practical Level 6	8,454	Music Theory Level 7	224
Music Practical Level 7	7,754	Graded Dance: Grade 6	36
Speech and Drama Studies Grade 8	2,386	Music Practitioner Extended Diploma	16
Speech and Drama Studies Grade 7	988	Graded Dance: Grade 7	15
Speech and Drama Studies Grade 6	961	Music Practitioner Diploma	11
Music	550	Graded Dance: Grade 8	10
Music Theory Level 6	497	Music Practitioner Certificate	4
Music Theory Level 8	372	Music Practitioner Subsidiary Diploma	1

Traditional academic – Other academic			
Advanced Extension Award	93,668	Asset Languages - Listening	278
Scottish Standard Grade	36,797	Certificate of Proficiency in English (CPE)	273
Foundation Studies	16,078	Certificate of Advanced English (CAE)	171
Irish Leaving (Ordinary)	15,467	Asset Languages - Reading	155
AQA Enrichment	13,998	Pre-U Short Course	115
Pre-U Certificate	5,790	Asset Languages - Writing	110
CACHE Theory	5,337	CIE AO (Advanced Ordinary)	103
SQA CSYS	1,735	Asset Languages - Speaking	100
Pre-U GPR	1,251	Graded Speech and Drama Examinations	72
AICE	645	GCE Advanced Level with Advanced Subsidiary (9 units)	53
AAT Diploma in Accounting	309	Pre-U Diploma	44

Vocational qualifications

Vocational – BTEC	
BTEC National Award – where not coded separately	240,308
BTEC Level 3 Extended Diploma. (was National Dip. 180+) (QCF)	37,426
BTEC Level 3 Subsidiary Diploma (was National Award 60+) (QCF)	12,380
BTEC Level 3 Diploma (was National Certificate 120+) (QCF)	10,053
BTEC National Diploma (NQF)	4,715
BTEC Level 3 Foundation Diploma 120 (QCF/FAD)	3,267
BTEC Level 3 Cert (= 50% of National Award 28-36) (QCF)	2,055
BTEC National Award (NQF)	1,711
BTEC National in Early Years (NQF)	1,610
BTEC National Certificate (NQF)	1,238
BTEC Specialist Diploma (QCF)	783
BTEC Level 3 National Diploma (NQF/CQF)	723
BTEC Level 3 Extended Diploma (was National Dip. 180+) (QCF/CQF)	610
BTEC Higher National Diploma (NQF)	534
BTEC Level 5 HND Diploma 240+ (QCF)	404
BTEC Specialist Award (QCF)	294
BTEC Level 4 Foundation Diploma 120+ (QCF/FAD)	268
BTEC Level 3 National Certificate (NQF/CQF)	247
BTEC Level 3 National Diploma (Legacy)	243
BTEC Level 3 Subsidiary Diploma (was National Award 60+)	205
BTEC Level 4 HNC Diploma 120+ (QCF)	200
BTEC Level 3 National Award (NQF/CQF)	192

BTEC Specialist Certificate (QCF)	183
BTEC Level 5 Higher National Diploma (NQF/CQF)	165
BTEC Higher National Certificate (NQF)	161
BTEC Level 3 Diploma (was National Certificate 120+)	143
BTEC Level 3 Foundation Diploma (NQF/FAD)	131
BTEC Level 3 Diploma (NQF/ASL)	124
BTEC Certificate (NQF/ASL)	93
BTEC Level 5 Higher National Certificate (NQF/CQF)	73
BTEC Level 3 Award (NQF/ASL)	71
BTEC Level 3 National Certificate (Legacy)	69
BTEC 90 Credit Diploma (QCF)	62
BTEC Level 5 Higher National Diploma (Legacy)	55
BTEC Level 3 Diploma Group C (NQF/ASL)	49
BTEC Level 5 HND Diploma 240+ (QCF/CQF)	33
BTEC Level 3 Cert (= 50% of National Award 28-36) (QCF/CQF)	29
BTEC Diploma (FAD/Legacy)	23
BTEC Extended Certificate (NQF/ASL)	14
BTEC Level 5 Higher National Certificate (Legacy)	14
BTEC Level 3 Diploma Group B (NQF/ASL)	13
BTEC Level 3 Diploma Group A (NQF/ASL)	11
BTEC Level 4 HNC Diploma 120+ (QCF/CQF)	10
BTEC Level 3 Extended Certificate (NQF/ASL)	9
BTEC Level 3 Award Group C (NQF/ASL)	6
BTEC Level 3 Award Group A (NQF/ASL)	5
BTEC Level 3 Award Group B (NQF/ASL)	1
BTEC Certificate Group A (NQF/ASL)	1

BTEC Certificate Group B (NQF/ASL)	I
BTEC Certificate Group D (NQF/ASL)	I
BTEC Level 3 Extended Certificate (NQF/ASL)	I

Vocational – Access courses			
Access to HE Diploma	23,384	Access to HE Diploma (West Midlands)	190
Access to HE Diploma (London)	3,124	Access to HE Diploma (Laser Learning Awards)	170
Access to HE Diploma (Open Awards)	676	Access to HE Diploma (CAVA)	154
Access to HE Diploma (AQA)	452	Access to HE Diploma (North East Region)	96
Access to HE Diploma (Yorkshire & Humber)	409	Access to HE Diploma (AIM Awards)	74
Access to HE Diploma (Ascentis)	295	Access to HE Diploma (Agored Cymru)	48
Access to HE Diploma (South West Learning)	285	Access to HE Diploma (Credit 4 Learning)	17
Access to HE Diploma (Eastern Region)	205		

Other vocational			
Diploma in Foundation Studies (Art/Design)	19,643	i-Media Certificate	256
Functional Skills Level 2	18,750	EDI level 3 certificate in Accounting	223
OCR National Certificate	16,841	Level 3 Diploma in Fashion Retail	215
VCE Advanced Double Award	13,473	CACHE Award in Child Care and Education	198
VCE Advanced	13,200	Higher Sports Leader Award	164
Financial Services (Certificate)	12,323	i-Media Diploma	116
OCR National Diploma	10,476	Scottish National Certificate (Band A)	112
GNVQ	8,593	Extended Diploma	78
Financial Services (Diploma)	7,592	City and Guilds Land Based Services: Extended Dip	50
CACHE Diploma in Child Care and Education	7,215	EDI level 3 Certificate in Accounting (IAS)	33
VCE Advanced Subsidiary	6,737	City and Guilds Land Based Services: Diploma	30
CACHE Practical	5,666	Functional Skills Level 3	29
Advanced Diploma	3,309	City and Guilds Land Based Services: Certificate	27
OCR National Extended Diploma	3,054	Vocational Dance Intermediate	27
SQA Skills for Work INT2	1,109	Cache Extended Diploma	21
Level 3 NVQ in Accounting	1,108	Certificate in Mathematics for Engineers	13
Functional Skills Level 1	531	Scottish National Certificate (Band C)	11
OCR iPro Certificate	500	City and Guilds Land Based Services: Subs. Diploma	7
CACHE Certificate in Child Care	472	Vocational Dance Advanced Foundation	6
Scottish National Certificate (Band B)	450	Functional Skills Level 4	5
Progression Diploma	416	CISI Introduction to Securities and Investment	4
OCR iPro Diploma	396		

Appendix 2: Multi-level logistic regression specification

Model Specification

Logistic regression expresses the probability of a dependent variable – in this case achieving a first or upper second class degree – an outcome of a set of independent variables. Formally, this can be expressed as:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} \dots \beta_k X_{ki}$$

In which Y_i is the outcome for individual i , $x_{1i} \dots x_{ki}$ are values of predictor variables for individual i , and β_k are a set of associated coefficients. In subsequent models, this equation is elaborated as a multi-level modelling with the following specification:

$$\text{Level 1: } Y_{ij} = \beta_{0j} + \beta_{1j} VQ_{ij} + \beta_2 x_{2ij} \dots \beta_k x_{kij}$$

$$\text{Level 2: } \beta_{0j} = \gamma_{01} + \gamma_{02} z_{1j} \dots \gamma_{0m} z_{mj}$$

$$\beta_{1j} = \gamma_{11} + \gamma_{12} z_{1j} \dots \gamma_{1m} z_{mj}$$

In this case, the outcome variable is specified as student i in institution j , students are nested institutions. Level one specifies the effect for student level variables (e.g. age on entry, tariff, etc), with variables $x_{2i} \dots x_{ki}$ and effects β_{2-k} . The vocational qualifications are denoted separately as VQ_{ij} . In this case, the intercept (β_{0j}) and coefficient for vocational qualifications (β_{1j}) are random effects, meaning that they are calculated separately for each institution (j) in the dataset. Level two specifies how these variables are computed as an outcome of institutional level variables ($z_{2j} \dots z_{mj}$) and their associated coefficients ($\gamma_{01} \dots \gamma_{0m}$ for β_{0j} and $\gamma_{11} \dots \gamma_{1m}$ for β_{1j}). Readers are advised to consult a sources on multi-level modelling for further details on the specifications of these models (e.g. Goldstein, 1995; Pinheiro and Bates 2000; Snijders and Bosker 1999).

Interpreting regression coefficients

Given this specification, the dependent variable Y is given as the log odds of a positive outcome on the dependent variable. The log odds can be converted to a probability

$$\text{Probability} = \frac{e^Y}{1+e^Y}$$

Using these two formulas, regression coefficients from the models can be converted into the probability of a positive outcome on the dependent variable. For example, using the coefficients from Model 1, we can express the log odds of a positive outcome for a male student with vocational qualifications, an entry tariff of 250 points, from a low-participation neighbourhood, entering at age 18 and studying full-time as follows:

$$Y = -2.69 - 0.69 - 0.08 + (0.01 \times 250) = -0.96$$

Then the probability of a positive outcome can thus be expressed as

$$\text{Probability} = \frac{e^{-0.96}}{1 + e^{-0.96}} = 0.276 = 27.6\%$$

The changes in probability that are associated with effects in section X (e.g. a 3.3% decrease in the chance of receiving an upper degree) are calculated by comparing the probability for the intercept alone ($Y = -2.64$) and that for the intercept and the vocational qualifications effect ($Y = -2.64 - 0.71 = -3.35$)

$$\text{Probability} = \frac{e^{-2.64}}{1 + e^{-2.64}} - \frac{e^{-2.64 - 0.71}}{1 + e^{-2.64 - 0.71}} = 0.033 = 3.3\%$$

It is important to recognize that the predicted probability is based on the average across the dataset and will not necessarily correspond to an outcome for a given individual.

Appendix 3: HEA discipline clusters

HEA discipline clusters			
Arts and Humanities	Health and Social Care	Science, Technology, Engineering and Mathematics (STEM)	Social Science
Archaeology and Classics	Health	Biological Sciences	Anthropology
Area Studies	Medicine and Dentistry	Built Environment	Business and Management
Art and Design	Nursing and Midwifery	Computing	Economics
Cinematics and Photography	Social Work and Social Policy	Engineering	Education
Dance	Veterinary Medicine.	Geography	Finance and Accounting
Drama and Music		Earth and Environmental Sciences	Hospitality
English		Mathematics	Leisure
History		Statistics and Operations Research	Sport and Tourism
Journalism		Physical Sciences	Islamic Studies
Languages		Psychology	Law
Linguistics			Marketing
Media Communications			Politics

Source: HEA Homepage. Disciplines [Internet]. Available from:
<https://www.heacademy.ac.uk/workstreams-research/disciplines>

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